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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	:	Frederic Nigon et al.
Serial No.	:	10/005,091
Filing Date	:	December 5, 2001
For	:	WHEEL PARAMETER MEASURING SYSTEM AND MEASURING DETECTOR FOR SUCH A SYSTEM
Group Art Unit	:	Not Assigned
Examiner	:	Not Assigned
Attorney Docket No.	:	TRW(F)5992

Assistant Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to examination, please amend the above-identified patent application (certified English translation version) as follows:

TITLE:

Please change the Title of the Invention to the following:

MEASURING SYSTEM FOR WHEEL PARAMETERS AND MEASURING DETECTOR FOR SUCH A SYSTEM

IN THE ABSTRACT:

Please amend the Abstract as follows:

ABSTRACT

Measuring system for measuring at least one parameter indicative of the state of the tires of a vehicle, which comprises on each wheel a detector (12) having a parameter sensor (13) and an antenna (15) tuned to a defined frequency, and which comprises a central data processing unit (24) coupled by individual wire links (22) to fixed antennas that are installed near the wheels equipped with sensors. Each parameter sensor comprises a transponder associated with a capacitor to store the power from the associated fixed antenna. At least one of the fixed and mobile antennas is configured in such a way that the link with the other antenna corresponding to the same wheel is substantially independent of the angular position of the wheel.

IN THE SPECIFICATION:

Page 2, replace the fourth paragraph with the following:

A system of this type, described in U.S. Patent No. 5,541,574, comprises a tube that is sufficiently elastic to be slipped over the edge of the wheel rim so that it rests against the wheel rim and contains the sensor and the antenna.

Page 5, replace the last paragraph and continuing on page 6, with the following:

Each load wheel 10 of the vehicle, and possibly also the spare wheel, is equipped with a temperature and/or pressure detector 12, hereinafter referred to as "parameter detector," for sending a message that contains information on at least one and often two or more parameters. For this purpose, each detector 12 comprises a sensor 13 having a radio frequency transmitter-receiver, which generally operates in a band ranging from 100 to 500 kHZ or approximately 13.56 MHz, substantially lower than the UHF band (above 300 MHz) typically used in the prior art, and an antenna 15. A reader housing 16, installed near the wheel rim and generally carried by the part of the suspension integral with the wheel, is linked to an antenna 18 tuned to the transmitting frequency of the transmitter/receiver of sensor 13. A wire link 22 comprising at least a

signal conductor, a line conductor and a ground conductor links the housing 16 to a central computation and processing unit 24.

IN THE CLAIMS:

Please cancel claims 1-12 without prejudice or disclaimer.

Please add new claims 13-34 as follows:

13. Measuring system for measuring at least one parameter that is indicative of a state of a tire of a vehicle, comprising:

on each wheel, a detector having a parameter sensor and a detector antenna tuned to a defined frequency,

a central data processing unit coupled by individual wire links to fixed antennas, each of the fixed antennas having an associated wheel and each of the fixed antennas being arranged near its associated wheel,

the parameter sensor comprising a transponder with a capacitor for storing power, the power being transmitted to the parameter sensor of the detector from an associated fixed antenna,

at least one of the associated fixed antenna and the detector antenna being a loop that is substantially centered over an axis of the associated wheel so that a communication link with the other one of the associated fixed antenna and the detector antenna corresponding to the associated wheel is

substantially independent of an angular position of the associated wheel, and

the detector antenna being insulated from the associated wheel rim when the wheel rim is made of metal.

14. System as claimed in claim 13, characterized in that the detector antenna is formed by one of a loop and a coil that is embedded in the interior of the tire.

15. System as claimed in claim 13, characterized in that the detector antenna is formed by one of a loop and a coil that is integrated into the tire.

16. System as claimed in claim 13, characterized in that the parameter sensor and the detector antenna of the detector are fixed on an annular support for running flat carried by the wheel rim.

17. System as claimed in claim 13 characterized in that the associated fixed antenna is formed by one of a loop and coil that is centered over the axis of the wheel and is carried by a part of a wheel suspension that is integral with the associated wheel.

18. System as claimed in claim 13 characterized in that the detector antenna and the parameter sensor of the detector are fixed to the interior surface of the tire.

19. System as claimed in claim 13 characterized in that the detector antenna and the parameter sensor of the detector are embedded in the interior of the tire.

20. System as claimed in claim 13 characterized in that an interior zone of the tire is directly molded over the detector antenna and the parameter sensor of the detector.

21. System as claimed in claim 13 characterized in that the parameter sensor comprises a memory in which information identifying at least one of the tire, the wheel, and an annular support is stored during manufacture.

22. System as claimed in claim 13 characterized in that the detector antenna is in the form of one of a loop and a coil, the detector antenna being followed by a tuning circuit having an inductor and a capacitor, a rectifier and a circuit with at least one power storage capacitor, as well as a status device, which receives output signals of the parameter sensor and supplies a modulating signal to an impedance modulation circuit of the detector antenna.

23. System as claimed in claim 13 characterized in that the parameter sensor and the detector antenna are fixed to a wheel rim made of one of a non-conductive material and a weakly conductive material.

24. System as claimed in claim 13 characterized in that the parameter sensor and the detector antenna are integrated in a wheel rim made of one of a non-conductive material and a weakly conductive material.

25. System as claimed in claim 13 characterized in that the associated wheel also carries at least one of lateral, vertical and longitudinal acceleration measuring means, each of which is connected to the detector antenna.

26. System as claimed in claims 13 characterized in that the central data processing unit is configured successively to poll several parameter sensors carried by the associated wheel.

27. Detector for a vehicle wheel intended for a measuring system to measure at least one parameter that is indicative of a state of a tire, comprising:

a parameter sensor having a transponder with a rectifier for receiving radio frequency power and with a power storage capacitor, and

an antenna tuned to a defined radio frequency, the antenna being formed by one of a loop and coil,

the antenna and the parameter sensor being carried by one of an interior surface of the tire, a flat-running support, and a wheel rim,

the parameter sensor comprising a memory in which is stored information identifying at least one of the tire, the wheel rim, and the flat running support.

28. Measuring system for a vehicle having multiple wheels, each wheel having an associated tire, the measuring system comprising:

a detector having a parameter sensor and a detector antenna tuned to a defined frequency, the detector being at least partially located within a first vehicle tire and being fixed relative to the first tire for rotation about an axis, the detector measuring at least one tire condition parameter of the first tire,

a data processing unit mounted on the vehicle and coupled by individual wire links to a first fixed antenna being arranged near the first tire,

at least one of the first fixed antenna and the detector antenna being a loop that is substantially centered relative to the axis so that a communication link with the other one of the first fixed antenna and the detector antenna is substantially independent of an angular position of the first tire.

29. System as claimed in claim 28 wherein the first tire is mounted on a metal rim, the detector antenna being insulated from the metal rim.

30. System as claimed in claim 28 wherein a second fixed antenna is arranged near a second tire of the vehicle, the second fixed antenna being configured to communicate with another detector that is at least partially located within the second tire.

31. System as claimed in claim 28 wherein the parameter sensor includes a transponder with a capacitor for storing power, the power being transmitted to the parameter sensor of the detector from the first fixed antenna.

32. Measuring system for measuring at least one parameter that is indicative of a state of a tire mounted on a wheel of a vehicle, the system comprising:

an annular support for enabling operation of the wheel when the tire is flat, the annular support being supported on the wheel and within the tire, and

a sensor for sensing at least one parameter of the tire and for providing a signal indicative thereof, the sensor being supported by the annular support.

33. System as claimed in claim 32 characterized in that the sensor comprises a memory in which information identifying at least one of the annular support, the wheel, and the tire is stored.

34. System as claimed in claim 32 wherein the tire is mounted on a metal rim, the annular support insulating the detector antenna from the metal rim.

REMARKS

Examination of the above-identified patent application in view of the present preliminary amendment is respectfully requested.

The present preliminary amendment cancels claims 1-12 and adds new claims 13-34. The present amendment also amends the Title of the Invention, amends minor errors in the specification, and cancels two paragraphs of the Abstract.

Attached hereto is a marked-up version of the changes made to the Title, Abstract, Specification and Claims by the current preliminary amendment. The attached page is captioned **"Version with markings to show changes made."**

Please charge any deficiency or credit any overpayment in the fees for this amendment to our Deposit Account No. 20-0090.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

The title has been amended as follows:

~~**WHEEL PARAMETER MEASURING SYSTEM AND MEASURING DETECTOR FOR SUCH A SYSTEM**~~

MEASURING SYSTEM FOR WHEEL PARAMETERS AND MEASURING DETECTOR FOR SUCH A SYSTEM

IN THE ABSTRACT:

The Abstract has been amended as follows:

ABSTRACT

~~MEASURING SYSTEM FOR WHEEL PARAMETERS AND MEASURING DETECTOR FOR SUCH A SYSTEM~~

Measuring system for measuring at least one parameter indicative of the state of the tires of a vehicle, which comprises on each wheel a detector (12) having a parameter sensor (13) and an antenna (15) tuned to a defined frequency, and which comprises a central data processing unit (24) coupled by individual wire links (22) to fixed antennas that are installed near the wheels equipped with sensors. Each parameter sensor comprises a transponder associated with a capacitor to store the power from the associated fixed antenna. At least one of the fixed and mobile antennas is configured in such a way that the link with the other antenna corresponding to the same wheel is substantially independent of the angular position of the wheel.

~~Figure 1~~

IN THE SPECIFICATION:

The fourth paragraph on page 2, has been amended as follows:

A system of this type, described in ~~US A-6,541,574,~~ U.S. Patent No. 5,541,574, comprises a tube that is sufficiently elastic to be slipped over the edge of the wheel rim so that it rests against the wheel rim and contains the sensor and the antenna.

The last paragraph beginning on page 5 and continuing on page 6, has been amended as follows:

Each load wheel 10 of the vehicle, and possibly also the spare wheel, is equipped with a temperature and/or pressure detector 12, hereinafter referred to as "parameter detector," for sending a message that contains information on at least one and often two or more parameters. For this purpose, each detector 12 comprises a ~~capacitor~~ sensor 13 having a radio frequency transmitter-receiver, which generally operates in a band ranging from 100 to 500 kHz or approximately 13.56 MHz, substantially lower than the UHF band (above 300 MHz) typically used in the prior art, and an antenna 15. A read housing 16, installed near the wheel rim and generally carried by the part of the suspension integral with the wheel, is linked to an antenna 18 tuned to the transmitting frequency of the transmitter/receiver of sensor 13. A wire link 22 comprising at least a signal

conductor, a line conductor and a ground conductor links the housing 16 to a central computation and processing unit 24.

IN THE CLAIMS:

Claims 1-12 have been cancelled.

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